Claim 1 (previously presented): A multiband data communication apparatus which receives signals by switching a plurality of frequency bands in response to a band switching signal, said multiband data communication apparatus comprising:

quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into a quadrature reception baseband signal, said quadrature demodulating means including:

a pair of first quadrature mixers for converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal;

local oscillating means for producing a local oscillation signal; and

phase shifting means for inputting said band switching signal and for shifting a phase of said local oscillation signal based upon said band switching signal to thereby supply the phase-shifted local oscillation signal to one or both of said pair of first quadrature mixers.

Claim 2 (currently amended): A multiband data communication apparatus which transmits signals by switching a plurality of frequency band in response to a band switching signal, said multiband data communication apparatus comprising:

quadrature modulating means for converting a quadrature transmission baseband signal into either a transmission signal or a transmission intermediate frequency signal, said

quadrature modulating means including:

a pair of second quadrature mixers for converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal;

local oscillating means for producing a local oscillation signal; and

phase shifting means for inputting said band switching signal and for shifting a phase of said local oscillation signal based upon said band switching signal to thereby supply the phase-shifted local oscillation signal to one or both of said pair of second quadrature mixers.

Claim 3 (previously presented): A multiband data communication apparatus comprising:

quadrature modulating means for converting a quadrature transmission baseband signal into either a transmission signal or a transmission intermediate frequency signal;

quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into a quadrature reception baseband signal; and

local oscillation signal producing means for supplying a local oscillation signal to both said quadrature modulating means and said quadrature demodulating means, for transmitting/receiving by switching a plurality of frequency bands in response to a band switching signal,

wherein said quadrature demodulating means includes a pair of first quadrature mixers for converting either the reception signal or the reception intermediate frequency

signal into a reception baseband signal; and wherein

said quadrature modulating means includes a pair of second quadrature mixers for converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal; and further wherein

said local oscillation signal producing means includes local oscillating means for producing a local oscillation signal, and said apparatus further comprises

phase shifting means for shifting a phase of said local oscillation signal based upon said band switching signal to thereby supply the phase-shifted local oscillation signal to one or both of said pair of first quadrature mixers and to one or both of said pair of second quadrature mixers.

Claim 4 (previously presented): A multiband data communication apparatus as claimed in claim 3, wherein said phase shifting means supplies a signal obtained by shifting the phase of said local oscillation signal by $\Pi/2$ to one of said pair of first quadrature mixers and one of said pair of second quadrature mixers, while said phase shifting means supplies one of said local oscillation signal and a signal obtained by inverting a code of said local oscillation signal to the other of said pair of first quadrature mixers and to the other of said pair of second quadrature mixers in response to said band switching signal.

Claim 5 (previously presented): A multiband data communication apparatus as claimed in claim 3, wherein said phase shifting means supplies said local oscillation signal to one of said pair of first quadrature mixers and to one of said pair of second quadrature mixers; while said phase shifting means supplies one of a signal obtained by shifting the phase of said local oscillation signal by $\Pi/2$ and a signal obtained by shifting the phase of said local oscillation signal by $\Pi/2$ and ~~by~~ then inverting said phase-shifted local oscillation signal to the other mixer of said pair of first quadrature mixers and also to the other mixer of said pair of second quadrature mixers in response to said band switching signal.

Claim 6 (previously presented): A multiband data communication apparatus as claimed in claim 3, wherein said phase shifting means supplies said local oscillation signal to one of said pair of first quadrature mixers and to one of said pair of second quadrature mixers, while said phase shifting means supplies one of a signal obtained by delaying the phase of said local oscillation signal by $\Pi/2$ and a signal obtained by advancing the phase of said local oscillation signal by $\Pi/2$ to the other of said pair of first quadrature mixers and also to the other of said pair of second quadrature mixers in response to said band switching signal.

Claim 7 (previously presented): A multiband data communication apparatus which receives signals by switching a plurality of frequency bands in response to a band switching

signal, said multiband data communication apparatus comprising:

quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into quadrature reception baseband signal, said quadrature demodulating means including:

a pair of first quadrature mixers for converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal;

storage means for saving thereinto discrete data a frequency pattern component functioning as a base;

address generating means for generating an address every preselected clock;

phase shift means for adding a predetermined number based upon said band switching signal to said address;

first analog converting means for analog-converting data which is read out by addressing said storage means based on the address outputted from said address generating means to thereby supply the analog-converted data to one of said pair of first quadrature mixers; and

second analog converting means for analog-converting data which is read out by addressing said storage means based on the output of said phase shift means to thereby supply the analog-converted data to the other of said pair of first quadrature mixers.

Claim 8 (previously presented): A multiband data communication apparatus which transmits signals by switching a

plurality of frequency band in response to a band switching signal, said multiband data communication apparatus comprising:

quadrature modulating means for converting a quadrature transmission baseband signal into either a transmission signal or a transmission intermediate frequency signal, said quadrature modulating means including:

a pair of second quadrature mixers for converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal;

storage means for saving thereinto discrete data of a frequency pattern component functioning as a base address generating means for generating an address every preselected clock;

phase shift means for adding a predetermined number based upon said band switching signal to said address;

first analog converting means for analog-converting data which is read out by addressing said storage means based on the address outputted from said address generating means to thereby supply the analog-converted data to one of said pair of second guadrature mixers; and

second analog converting means for analog-converting data which is read out by addressing said storage means based on the output of said phase shift means to thereby supply the analog-converted data to the other of said pair of second quadrature mixers.

Claim 9 (previously presented): A multiband data communication apparatus comprising:

quadrature modulating means for converting a quadrature transmission baseband signal into either a transmission signal or a transmission intermediate frequency signal;

quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into a quadrature reception baseband signal; and

local signal producing means for supplying a local oscillation signal to both said quadrature modulating means and said quadrature demodulating means, for transmitting/receiving by switching a plurality of frequency bands in response to a band switching signal, wherein

said quadrature demodulating means includes a pair of first quadrature mixers for converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal; and further wherein

said quadrature modulating means includes a pair of second quadrature mixers for converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal; and still further wherein

said local oscillation signal producing means includes storage means for saving thereinto discrete data of a frequency pattern component functioning as a base; address generating means for generating an address every preselected clock; phase shift means for adding a predetermined number based upon said band switching signal to said address; first

analog converting means for analog-converting data which is read out by addressing said storage means based on the address outputted from said address generating means to thereby supply the analog-converted data to one of said pair of first quadrature mixers; and second analog converting means for analog-converting data which is read out by addressing said storage means based on the output of said phase shift means to thereby supply the analog-converted data to the other of said pair of first quadrature mixers.

Claim 10 (previously presented): A multiband data communication apparatus as claimed in claim 9, wherein either said quadrature modulating means or said local oscillation signal producing means includes clock generating means for generating a clock signal and interval determining means for determining a clock interval used to read out data from said storage means so as to control the address generating operation of said address generating means.

Claim 11 (previously presented): A communication method of a multiband data communication apparatus including quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into a quadrature reception baseband signal, for receiving by switching a plurality of frequency bands in response to a band switching signal, said communication method comprising the steps of:

producing a local oscillation signal;

providing said band switching signal to a means for shifting a phase for controlling said means for shifting a phase and

using said means for shifting a phase for shifting a phase of said local oscillation signal in response to said band switching signal to thereby supply the phase-shifted local oscillation signal to a first quadrature mixer for converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal.

Claim 12 (currently amended): A communication method of a multiband data communication apparatus including quadrature modulating means for converting a quadrature transmission baseband signal into either a transmission signal or a transmission intermediate frequency signal, for transmitting by switching a plurality of frequency band in response to a band switching signal, said communication method comprising the steps of:

producing a local oscillation signal;

providing said band switching signal to a means for shifting a phase for controlling said means for shifting a phase; and

using said means for shifting a phase for shifting a phase of said local oscillation signal in response to said band switching signal to thereby supply the phase-shifted local oscillation signal to a second quadrature mixer for converting a transmission baseband signal into either the

transmission signal or the transmission intermediate frequency signal.

Claim 13 (previously presented): A communication method of a multiband data communication apparatus including quadrature modulating means for converting a quadrature transmission baseband signal into either a transmission signal or a transmission intermediate frequency signal; and quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into a quadrature reception baseband signal wherein said apparatus transmits and receives signals by switching a plurality of frequency bands in response to a band switching signal, said communication method comprising the steps of:

producing a local oscillation signal; and

shifting a phase of said local oscillation signal in response to the band switching signal to thereby supply the phase-shifted local oscillation signal to one or both of a first quadrature mixer and a second quadrature mixer, said first quadrature mixer converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal, and said second quadrature mixer converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal.

Claim 14 (previously presented): A communication method of a multiband data communication apparatus as claimed in

claim 13, wherein said phase shifting step includes:

a first supplying step for supplying a signal which is obtained by shifting the phase of said local oscillation signal by π/2 to one of said first quadrature mixer and said second quadrature mixer;

an inverting step for inverting a code of said local oscillation signal; and

a second supplying step for supplying one of said local oscillation signal and the output signal of said inverting step to the other of said first quadrature mixer and said second quadrature mixer in response to said band switching signal.

Claim 15 (previously presented): A communication method of a multiband data communication apparatus as claimed in claim 13, wherein said phase shifting step includes:

a first supplying step for supplying said local oscillation signal to one of said first quadrature mixer and said second quadrature mixer;

a phase shifting step for shifting the phase of said local oscillation signal by π/2;

an inverting step for inverting a code of said output signal of said phase shifting step; and

a second supplying step for supplying one of said output signal of said phase shifting step and the output signal of said inverting step to the other of said first quadrature mixer and said second quadrature mixer in response to said band switching signal.

Claim 16 (previously presented): A communication method of a multiband data communication apparatus as claimed in claim 13, wherein said phase shifting step includes:

a first supplying step for supplying said local oscillation signal to one of said first quadrature mixer and said second quadrature mixer;

a phase delaying step for delaying the phase of said local oscillation signal by $\Pi/2$;

a phase advancing step for advancing the phase of said local oscillation signal by $\Pi/2$; and

a second supplying step for supplying one of the output signal of said phase delaying step and the output signal of said phase advancing step to the other of said first quadrature mixer and said second quadrature mixer in response to said band switching signal.

Claim 17 (previously presented): A communication method of a multiband data communication apparatus including quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into a quadrature reception baseband signal, for receiving by switching a plurality of frequency bands in response to a band switching signal, said communication method comprising:

a storing step for saving discrete data of a frequency pattern component functioning as a base;

an address generating step for generating an address every preselected clock signal;

a phase shifting step for adding a predetermined number based upon said band switching signal to said address;

a first analog converting step for analog-converting data which is read out by addressing said storing step based on the address outputted from said address generating step to thereby supply the analog-converted data to one of a pair of first quadrature mixers for converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal; and

a second analog converting step for analog-converting data which is read out by addressing said storing step based on the output of said phase shifting step to thereby supply the analog-converted data to the other of said first quadrature mixers.

Claim 18 (previously presented): A communication method of a multiband data communication apparatus including quadrature modulating means for converting a quadrature transmission baseband signal into either a transmission signal or a transmission intermediate frequency signal, for transmitting by switching a plurality of frequency band in response to a band switching signal, said communication method comprising:

a storing step for saving discrete data of a frequency pattern component functioning as a base;

an address generating step for generating an address every preselected clock signal;

a phase shifting step for adding a predetermined number

based upon said band switching signal to said address;

a first analog converting step for analog-converting data which is read out by addressing said storing step based on the address outputted from said address generating step to thereby supply the analog-converted data to one of a pair of second quadrature mixers for converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal; and

a second analog converting step for analog-converting data which is read out by addressing said storing step based on the output of said phase shifting step to thereby supply the analog-converted data to the other of said second quadrature mixers.

Claim 19 (previously presented): A communication method of a multiband data communication apparatus including quadrature modulating means for converting a quadrature transmission baseband signal into either a transmission signal or a transmission intermediate frequency signal; and quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into a quadrature reception baseband signal; and for transmitting/receiving by switching a plurality of frequency bands in response to a band switching signal, said communication method comprising:

a storing step for saving discrete data of a frequency pattern component functioning as a base;

an address generating step for generating an address

every preselected clock signal;

a phase shifting step for adding a predetermined number based upon said band switching signal to said address;

a first analog converting step for analog-converting data which is read out by addressing said storing step based on the address outputted from said address generating step to thereby supply the analog-converted data to one of a first quadrature mixer and a second quadrature mixer, said first quadrature mixer converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal, and said second quadrature mixer converting a transmission baseband signal into either the transmission signal or the transmission intermediate frequency signal; and

a second analog converting step for analog-converting data which is read out by addressing said storing step based on the output of said phase shifting step to thereby supply the analog-converted data to the other of said first quadrature mixer and said second quadrature mixer.

Claim 20 (original): A storage medium for storing thereinto a computer readable program used to execute the communication method of the multiband data communication apparatus as recited in claim 11, 12, 13, 14, 15, 16, 17, 18, or 19.

Claim 21 (previously presented): A multiband data communication apparatus which receives signals by switching a plurality of frequency bands in response to a band switching

signal, said multiband data communication apparatus comprising:

quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into a quadrature reception baseband signal, said quadrature demodulating means including:

a pair of first quadrature mixers for converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal;

local oscillating means for producing a local oscillation signal;

phase shifting means for shifting a phase of said local oscillation signal for input to one of said pair of first quadrature mixers; and

means for optionally changing a phase of said local oscillation signal for input to another of said pair of first quadrature mixers based upon said band switching signal to thereby ensure correct polarities of quadrature components of said reception baseband signal.

Claim 22 (previously presented): A multiband data communication apparatus which receives signals by switching a plurality of frequency bands in response to a band switching signal, said multiband data communication apparatus comprising:

quadrature demodulating means for converting either a reception signal or a reception intermediate frequency signal into a quadrature reception baseband signal, said quadrature

demodulating means including:

a pair of first quadrature mixers for converting either the reception signal or the reception intermediate frequency signal into a reception baseband signal;

local oscillating means for producing a local oscillation signal; and

phase shifting means for inputting said band switching signal for shifting a phase of said local oscillation signal to ensure consistent polarities of quadrature components of said reception baseband signal irrespective of an operating band of the apparatus.

Claim 23 (previously presented): A multiband data communication apparatus as claimed in claim 1, wherein said phase shifting means supplies a signal obtained by shifting the phase of said local oscillation signal by $\pi/2$ to one of said pair of first quadrature mixers, while said phase shifting means supplies one of said local oscillation signal and a signal obtained by inverting a code of said local oscillation signal to the other of said pair of first quadrature mixers in response to said band switching signal.

Claim 24 (previously presented): A multiband data communication apparatus as claimed in claim 1, wherein said phase shifting means supplies said local oscillation signal to one of said pair of first quadrature mixers while said phase shifting means supplies one of a signal obtained by shifting the phase of said local oscillation signal by $\pi/2$ and a signal

obtained by shifting the phase of said local oscillation signal by π/2 and then inverting said phase-shifted local oscillation signal to the other mixer of said pair of first quadrature mixers in response to said band switching signal.

Claim 25 (previously presented): A multiband data communication apparatus as claimed in claim 1, wherein said phase shifting means supplies said local oscillation signal to one of said pair of first quadrature mixers, while said phase shifting means supplies one of a signal obtained by delaying the phase of said local oscillation signal by π/2 and a signal obtained by advancing the phase of said local oscillation signal by π/2 to the other of said pair of first quadrature mixers in response to said band switching signal.

Claim 26 (previously presented): A multiband data communication apparatus as claimed in claim 2, wherein said phase shifting means supplies a signal obtained by shifting the phase of said local oscillation signal by π/2 to one of said pair of second quadrature mixers, while said phase shifting means supplies one of said local oscillation signal and a signal obtained by inverting a code of said local oscillation signal to the other of said pair of second quadrature mixers in response to said band switching signal.

Claim 27 (previously presented): A multiband data communication apparatus as claimed in claim 2, wherein said phase shifting means supplies said local oscillation signal to

one of said pair of second quadrature mixers while said phase shifting means supplies one of a signal obtained by shifting the phase of said local oscillation signal by $\pi/2$ and a signal obtained by shifting the phase of said local oscillation signal by $\pi/2$ and then inverting said phase-shifted local oscillation signal to the other mixer of said pair of second quadrature mixers in response to said band switching signal.

Claim 28 (previously presented): A multiband data communication apparatus as claimed in claim 2, wherein said phase shifting means supplies said local oscillation signal to one of said pair of second quadrature mixers, while said phase shifting means supplies one of a signal obtained by delaying the phase of said local oscillation signal by $\pi/2$ and a signal obtained by advancing the phase of said local oscillation signal by $\pi/2$ to the other of said pair of second quadrature mixers in response to said band switching signal.

Claim 29 (previously presented): A multiband data communication apparatus as claimed in claim 7, wherein either said quadrature demodulating means includes clock generating means for generating a clock signal and interval determining means for determining a clock interval used to read out data from said storage means so as to control the address generating operation of said address generating means.

Claim 30 (previously presented): A multiband data communication apparatus as claimed in claim 8, wherein either

said quadrature modulating means includes clock generating means for generating a clock signal and interval determining means for determining a clock interval used to read out data from said storage means so as to control the address generating operation of said address generating means.